



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,397	11/26/2003	Shih-Jong J. Lee	SV31	8873
29738	7590	10/04/2007	EXAMINER	
SHIH-JONG J. LEE			BITAR, NANCY	
15418 SE 53RD PLACE			ART UNIT	PAPER NUMBER
BELLEVUE, WA 98006			2624	
			MAIL DATE	DELIVERY MODE
			10/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/723,397	LEE ET AL.
	Examiner Nancy Bitar	Art Unit 2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 03 July 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-4,6,7,9-12,14-17,19-21 and 23-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-4,6,7,9-12,14-17,19-21 and 23-27 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 26 November 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>11/26/2003</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application
	6) <input type="checkbox"/> Other: _____

Response to Arguments

1. Applicant's arguments filed 07/05/2007 have been fully considered but they are not persuasive. Applicant argues that None of the prior art teaches creating matching function of subpixel values or invariant high precision parameters and the subpixel values can be estimated by image interpolation and interpolation parameter organization . Examiner disagree with applicant since Kurasawa clearly teaches the matching processor (18) and the matching processor executes pattern recognition in such a manner that it compares and collates the input pattern with a certain reference pattern that identifies that reference pattern is matched with the input pattern with high similarity . Examiner has combined references using hindsight reasoning it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case , Silver et al teaches the subpixel value or invariant high precision parameters can be estimated by image interpolation and interpolation parameter optimization see figure 17. Moreover Silver et al. teaches the "perfect fit" that correspond to the best match of the search result the initial image (image 130) and the template image (training image 100) in order to get a location accuracy and a highest degree of match (column 10, lines 24-52); Because the perfect fit help in identifying

differences between a stored pattern and a matching image subset, where variations in pattern position, orientation, and size do not give rise to false differences.

Examiner Notes

2. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 6-7, 9-12, 14-17, 19-21, 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kurosawa et al (U.S. Patent 4,972,499), Silver et al (U.S. Patent 7,164,796) and McConnell (U.S. Patent 4,567,610)

As to claim 1, Kurosawa teaches a fast high precision matching method comprising the steps of:

- a) Input an image (figure 1, element 12, column 3, lines 39-40);
- b) Input a template (column 4, lines 8-13, note that in figure 2 all the references templates are located in the database);
- c) Perform initial search using the input image and the template to create an initial search result output (figure 1, element 18 and 22, column 3, lines 51-62);
- d) Perform high precision match based on matching function of subpixel values or invariant high precision parameters using the initial search result, the input image, and the same template to create a high precision match result output (figure 1, element 24 and 26, column 4, lines 62-67, column 4, lines 1-21).

Kurosawa is silent about using invariant pattern search. However, McConnell discloses invariant pattern search (fig 2a -c and 3a-d and column 8, lines 36- 59, column 9, lines 30-49, the invariant search are comparing test and reference histograms).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Kurosawa by the teaching of McConnell because to map objects having characteristic radial features to determine orientation and for identification to improve the flexibility of the recognition system (as suggested by McConnell at column 9, lines 67-68, column 10, lines 1- 2, the output signal from the CPU, see equation 9, is the image output also see column 11, lines 4-41, the histograms that are generated are use to calculate the entropy being use for matching process). Neither Kurosawa nor

McConnell discloses the match as being high precision. Specifically, Silver et al. teaches the "perfect fit" that correspond to the best match of the search result the initial image (image 130) and the template image (training image 100) in order to get a location accuracy and a highest degree of match (column 10, lines 24-52); Because the perfect fit help in identifying differences between a stored pattern and a matching image subset, where variations in pattern position, orientation, and size do not give rise to false differences. It would have been obvious to one of ordinary skill in the art to use pattern inspection of an image in Kurasawa matching method in order to minimize the false differences between the pattern and image that can limit inspection performance (column 5, lines 50-62) thus resulting in an overall method for pattern inspection that is faster and more accurate. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 2, Silver et al. teaches method of claim 1 wherein the high precision match step comprises the estimation of high precision parameters by image interpolation and interpolation parameter optimization (interpolation method, figure 17).

As to claims 3 and 4, Silver et al et al. teaches the method of claim 1 wherein the high precision match step comprises a high precision match within and beyond one pixel range (the bits of field element 400 are divided between force 410 and direction 420 to provide greater or lesser precision and range, as needed for each particular application (column 14, lines 52/57; note that appropriate settings for the parameter values depend on the nature of the patterns and images to be analyzed, column 13, lines 66-67).

As to claim 6, Silver et al. teaches the method of claim 1 wherein the high precision match step performs robust matching limits pixel contribution with maximum allowable value for a pixel(gray-level pixel-grid-based methods are used for pattern inspection, column 3, lines 38-51).

As to claim 7, Silver et al. teaches the method of claim 5 wherein the high precision match step performs robust matching performs pixel weighting for various and covariance calculation (assign a weighting factor to each image dipole to indicate the relative reliability of the evidence; column 4, lines 63-67 and column 7, lines 32-50).

As to claims 9- 10, Silver et al. teaches the method of claim 9 wherein the template contains pre-calculated template variance parameters in addition to the template image (Several parameter values are needed for feature extraction, both in the training module 110 and in the run-time module 140, column 13, lines 57-65).

As to claims 11-12, teaches the method of claim 2 wherein the interpolation parameter optimization includes matching function maximization uses an iterative method for the subpixel values or invariant (figures 22-25).

The limitation of claim 14-16 has been addressed in claims 1,3,4 and 10

The limitation of claims 17,19-21,23-27 has been addressed above except for profile generation. McConnell teaches this limitation (invariant profile generation; pages 6 and 7 of the details description of the invention, figure 2a-c and 3a-d and column 8, lines 36-59, column 9, lines 30-49) in order to create an invariant high precision match result output (see McConnell figure 1,9-34 and column 13, lines 47-67, the histogram

that are generated are used to calculate the entropy being use for the matching process.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kurosawa to include (invariant image and template profile generation). It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Kurosawa by the teaching of McConnell, which is the generation of invariant profiles because to map objects having characteristic radial features to determine orientation and for identification to improve the flexibility of the recognition system (as suggested by McConnell at column 9, lines 66-67, column 10, lines 1-2).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

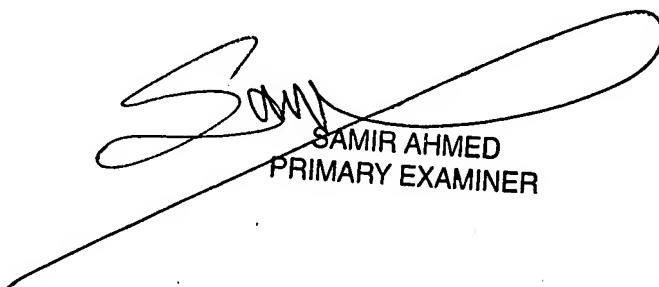
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nancy Bitar whose telephone number is 571-270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on 571-272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nancy Bitar

10/1/2007



SAMIR AHMED
PRIMARY EXAMINER